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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/590,456	10/31/2006	Marcus Brian Mayhall Fenton	C049105/0225761	8485

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EXAMINER	
CERNOCH, STEVEN MICHAEL	
ART UNIT	PAPER NUMBER
3752	
MAIL DATE	DELIVERY MODE
07/21/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/590,456	FENTON ET AL.	
	Examiner	Art Unit	
	STEVEN M. CERNOCH	3752	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 June 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *52-57,60-77 and 79-89* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *52-57,60-77 and 79-89* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *22 June 2010* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Drawings

The drawings were received on 6/22/2010. These drawings are acceptable.

Claim Rejections - 35 USC § 112

The rejections under 35 USC 112 2nd paragraph are hereby withdrawn due to the amendment filed 6/22/2010.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 52-57, 60-65, 67-70, 72-77, 79-83, 84-87 and 89 are rejected under 35 U.S.C. 103(a) as being unpatentable over Williams et al. (US Pat No 5,779,159) in view of Tanaka et al. (US Pat No 5,323,967).

Re claim 52, Williams et al. shows an apparatus for generating a mist (Fig. 1, N) comprising: a housing (B) having a plurality of interior walls, at least one of the plurality of interior walls defining a passageway (28) along a longitudinal center axis, the passageway having a transport fluid inlet (I), a plenum (PM) adjacent to the transport fluid inlet, a portion (18) adjacent to the plenum, and an outlet (under N); a protrusion (S) with a solid interior located proximate the portion, the protrusion having an outer surface tapered outwardly with respect to the axis; a means for generating a mist substantially of a desired droplet size from a working fluid with a transport fluid, the means including a transport nozzle and a working nozzle, a transport nozzle (O) being defined between: the at least one of the plurality of interior walls tapered outwardly with

respect to the axis along the portion, and the outer surface tapered outwardly of the protrusion; the working nozzle (PO) being defined by other of the plurality of interior walls of the housing, the working nozzle being coincident the transport nozzle so that the working fluid communicated to and exiting the working nozzle and the transport fluid communicated to and exiting the transport nozzle contact for the first time and mix (column 1, lines 34-37); wherein the working nozzle (PO) is defined by a working nozzle outer surface facing inward toward the axis and a working nozzle inner surface facing outward away from the axis; and a working fluid inlet (22) disposed along the housing in communication with the working nozzle.

Williams et al. does not show the at least one of the plurality of interior walls being continuously tapered outwardly with respect to the axis along the portion and the plenum adjacent to the transport fluid inlet being of different cross-sectional area than the transport fluid inlet at every point along the length of the plenum adjacent to the transport fluid inlet; wherein at least part of the working nozzle outer surface converges toward the axis in a direction along the axis toward the outlet.

However, Tanaka et al. does teach the at least one of the plurality of interior walls (Fig. 18, 110) being continuously tapered outwardly with respect to the axis along the portion and the plenum (left of 105) adjacent to the transport fluid inlet (105) being of different cross-sectional area than the transport fluid inlet at every point along the length of the plenum adjacent to the transport fluid inlet; wherein at least part of the working nozzle outer surface (104) converges toward the axis in a direction along the axis toward the outlet.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to have the motivation to modify the nozzle of Williams et al. with the nozzle of Tanaka et al. to increase the contact area (col. 3, lines 5-10).

Re claim 53, Williams et al. shows a chamber (Fig. 1, nearest N) adjacent the portion wherein the transport nozzle exits into the chamber and the working nozzle exits into the chamber so that the working fluid communicated to the working nozzle mixes in the chamber with the transport fluid exiting the transport nozzle.

Re claim 54, Williams et al. shows an apparatus for generating a mist (Fig. 1, N), the apparatus having an apparatus axis, the apparatus comprising: a housing, and a means for suppressing combustion with a mist, the means including: a first fluid passage (P) formed in the housing having a first fluid inlet (22) and a first fluid outlet (PO); the first fluid passage defining a working nozzle (PO); the first annular portion having a first outer surface facing inward toward the apparatus axis and a first inner surface facing outward away from the apparatus axis; the first fluid passage comprising a first annular portion concentric with the apparatus axis; a second fluid passage (W) formed in the housing having a second fluid inlet (I) and a second fluid outlet (O); a protrusion (S) located in the second fluid passage to define an annular transport nozzle (O) with a second inner surface facing outward away from the apparatus axis and a second outer surface facing inward toward the apparatus axis, that are both concentric to the apparatus axis and substantially frustroconical in shape and wherein the second inner surface and the second outer surface both diverge away from the apparatus axis in the direction toward the second fluid outlet, wherein the first fluid passage (P) and

second fluid passage (W) are separate before the first fluid outlet and the second fluid outlet.

Williams et al. does not teach wherein at least part of the first outer surface converges toward the apparatus axis in a direction toward the first fluid outlet.

However, Tanaka et al. shows wherein at least part of the first outer surface (Fig. 18, 104) converges toward the apparatus axis in a direction toward the first fluid outlet.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to have the motivation to modify the nozzle of Williams et al. with the nozzle of Tanaka et al. to increase the contact area (col. 3, lines 5-10).

Re claims 55 & 74, Williams et al. shows a transport plenum (Fig. 1, PM) within the apparatus and located in the second fluid passage (SS) between the second fluid inlet (I) and the transport nozzle (O).

Re claims 56, 75 & 77, Williams et al. shows wherein the second fluid inlet (Fig. 1, I), second fluid plenum (PM) and the second nozzle (P) are arranged axially (W) in the apparatus.

Re claim 57 & 76, Williams et al. shows the transport plenum (Fig. 1, PM) is concentric with the apparatus axis.

Re claim 60 & 79, Williams et al. shows a first fluid plenum (Fig. 1, P) within the apparatus and located in the first fluid passage between the first fluid inlet (22) and the working nozzle (PO), wherein the working fluid plenum is annular and circumscribes the apparatus axis.

Re claims 61 & 80, Williams et al. shows a working fluid plenum (Fig. 1, P) that substantially circumscribes the transport nozzle.

Re claim 62, Williams et al. shows a working fluid plenum (Fig. 1, P) that substantially circumscribes the protrusion.

Re claims 63 and 81, Williams et al. shows the working nozzle (Fig. 1, PO) has inner and outer surfaces at the first fluid outlet, each being substantially frustoconical in shape, wherein the inner surface of the working nozzle faces outward away from the apparatus axis and the outer surface of the working nozzle faces inward toward the apparatus axis.

Re claims 64 & 82, Williams et al. shows wherein the working nozzle (Fig. 1, PO) substantially circumscribes the transport nozzle.

Re claim 65, Williams et al. shows wherein the working nozzle (Fig. 1, PO) substantially circumscribes the protrusion.

Re claims 67, 69, 84 & 86, Williams et al. discloses the claimed invention except for an included angle of 6 or 12 degrees. It would have been obvious to one having ordinary skill in the art at the time of the invention was made to include an angle of 6 or 12 degrees, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Re claims 68 & 85, Williams et al. shows wherein the conduit comprises a mixing chamber (Fig. 1, nearest N), wherein the first fluid outlet (PO) and second fluid outlet (O) are connected to the mixing chamber.

Re claims 70 & 87, Williams et al. shows wherein the transport nozzle (Fig. 1, O) is shaped with a convergent-divergent profile (S) to provide supersonic flow of the transport fluid which flows there through.

Re claims 72 & 89, Williams et al. shows to spray water droplets on the fire (abstract).

Re claim 73, Williams et al. shows an apparatus for generating a mist (Fig. 1), the apparatus having an apparatus axis and an outlet end (nearest N), the apparatus comprising: a first fluid passage (P) having a first fluid inlet (22) and a first fluid outlet (PO); the first fluid passage defining a first nozzle; the first fluid outlet being annular and concentric with the apparatus axis, the first fluid passage comprising a first annular portion concentric with the apparatus axis, the first annular portion having a first outer surface facing inward toward the apparatus axis and a first inner surface facing outward away from the apparatus axis; a second fluid passage (W) having a second fluid inlet (I) and a second fluid outlet (O); the second fluid passage defining a second nozzle; the second fluid outlet being annular and concentric with the apparatus axis, the second fluid passage comprising a second annular portion concentric with the apparatus axis, the second annular portion having a second outer surface facing inward toward the apparatus axis and a second inner surface facing outward away from the apparatus axis; wherein at least part of the second outer surface diverges away from the apparatus axis in a direction toward the outlet end; and wherein at least part of the second inner surface diverges away (10) from the apparatus axis in a direction toward

the outlet end; and wherein the second fluid outlet is located between the first fluid outlet and the apparatus axis.

Williams et al. does not teach wherein at least part of the first outer surface converges toward the apparatus axis in a direction toward the outlet end.

However, Tanaka et al. does teach wherein at least part of the first outer surface (Fig. 18, 104) converges toward the apparatus axis in a direction toward the outlet end.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to have the motivation to modify the nozzle of Williams et al. with the nozzle of Tanaka et al. to increase the contact area (col. 3, lines 5-10).

Claims 66, 71, 83 and 88 are rejected under 35 U.S.C. 103(a) as being unpatentable over Williams et al. (US Pat No 5,779,159) in view of Tanaka et al. (US Pat No 5,323,967) as applied to claims 52-57, 60-65, 67-70, 72-77, 79-83, 84-87 and 89 above, and further in view of Pennamen et al. (5,810,252).

Re claims 66 & 83, Williams et al. does not show wherein the internal geometry of the transport nozzles has an exit area to throat area ratio, in the range of 1.75 to 15.

However, Pennamen et al. does teach wherein the internal geometry of the transport nozzles has an exit area to throat area ratio, in the range of 1.75 to 15 (column 2, lines 61-63).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to have the motivation to modify the channels of Williams et al. with the ratio of Pennamen et al. to ensure an atomization orifice (column 2, lines 52-56).

Re claims 71 and 88, Williams et al. does show where the working fluid is water (column 3, lines 7-11).

Williams et al. does not teach steam.

However, Pennamen et al. does teach steam (column 2, lines 64-65).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to have the motivation to modify the fluid of Williams et al. with the steam of Pennamen et al. to aide in atomization (52-55).

Response to Arguments

Applicant's arguments with respect to claims 52-89 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to STEVEN M. CERNOCH whose telephone number is (571)270-3540. The examiner can normally be reached on IFP.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Len Tran can be reached on (571)272-1184. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/S. M. C./
Examiner, Art Unit 3752
7/15/2010

/Len Tran/
Supervisory Patent Examiner, Art Unit 3752